

REMARKS

The title and specification have been amended to make editorial changes therein, bearing in mind the criticisms in the Official Action, to place the application in condition for allowance at the time of the next Official Action.

Claims 1-11, 14, and 42-49 were rejected as anticipated by SARAN 6,232,662. The Official Action lists claims 47-49 among the claims rejected on this basis, but does not explain the rejection of claims 47-49. Clarification is respectfully requested. Reconsideration and withdrawal of the rejection are respectfully requested.

SARAN discloses a bonding pad support structure in which a grid structure (similar to that shown in Figure 1) forms top layer 230 and a combination of grid structure 212 and IC structure 211 form bottom layer 210 (column 7, lines 20-50). The grid of SARAN Figure 1 that forms the grid structure 212 has a copper area ratio that is about 25%. As explained at column 6, lines 12-24, the grid is 80 microns square and includes plural square dielectric areas 12 that are each 3 microns on a side and separated by copper walls 0.5 microns thick; which means that there are about 529 separate dielectric areas with a combined area of 4761 square microns, and that the total area of the grid is 6400 square microns, so that the copper covers 1639 square microns or about 25% of the total grid area. SARAN does not disclose the specific components in IC structure 211 and thus its

copper area ratio cannot be determined. Accordingly, the copper area ratio of the bottom layer 210 cannot be determined. Since the copper area ratio of the bottom layer 210 cannot be determined, one of skill in the art could not determine whether the copper area ratio of the bottom layer 210 is less than or equal to 25% - the copper area ratio of the top layer 230. Thus, SARAN does not disclose whether the copper area ratio of the lower copper layer is equal to or lower than that of the upper layer, as set forth in claim 1, and claim 1 avoids the rejection under §102.

Claim 4 provides that the copper area ratio of the upper copper layer is at least 70%. As explained above, the copper area ratio of the upper layer in SARAN is about 25%. Thus, claim 4 further avoids the rejection under §102.

Claim 42 provides, among other features, that the copper layer is under the bonding pad and in electrical contact therewith and that one of the copper interconnect layers at the first level is under the copper layer and electrically isolated therefrom. The Official Action points to Figure 2 of SARAN as disclosing these features. However, none of the copper layers in Figure 2 are in electrical contact with the bonding pad. They are separated from the bonding pad by dielectric layer 204. While Figure 4 shows that the bonding pad 40 may be electrically connected to a support structure 41 with vias 42, there is nothing that shows that in this event that one of the copper

interconnect layers at the first level is under the copper layer and electrically isolated therefrom. Accordingly, one of skill in the art would not learn from this reference that the copper layer under the bonding pad is in electrical contact therewith and that one of the copper interconnect layers at the first level is under the copper layer and electrically isolated therefrom, as in claim 42, which thereby avoids the rejection under §102.

Claims 44 and 47 further provide that the copper layer includes first and second copper layers with a via plug therebetween. SARAN does not disclose that copper layer in electrical contact with the bonding pad includes two layers with a via plug therebetween as defined in claims 44 and 47 and thus these claims further avoid the rejection under §102.

SARAN also does not disclose the third and fourth interconnect levels of claims 45-46, 48-49, where the first copper layer is at the third level and the second copper layer is at the fourth levels. Accordingly, these claims further avoid the rejection under §102.

Claims 1-11, 14, and 42-46 were rejected as anticipated by HUNG et al. 2003/0020163. The Official Action does not list the claims rejected on this basis and does not address claims 47-49 and thus the status of claim 47-49 is uncertain. Clarification is respectfully requested. The claims have been amended and reconsideration and withdrawal of the rejection are respectfully requested.

HUNG et al. disclose a bonding pad support structure that includes plural metal layers 202, 208, and 214 that are electrically connected to each other with vias 207, 213. The layers are not electrically separated from each other as set forth in amended claim 1 ("not electrically connected...under said bonding pads") and thus amended claim 1 avoids the rejection under §102.

Claim 42 provides, among other features, that one of the copper interconnect layers at the first level is under the copper layer and electrically isolated therefrom. The Official Action points to Figures 2A-D of HUNG et al. as disclosing this feature. While Figure 2C shows that the bonding pad 228 is electrically connected to a support structure with vias 224, there is nothing that shows that in this event that one of the copper interconnect layers at the first level is under the copper layer and electrically isolated therefrom. Accordingly, one of skill in the art would not learn from this reference that the copper layer under the bonding pad is in electrical contact therewith and that one of the copper interconnect layers at the first level is under the copper layer and electrically isolated therefrom, as in claim 42, which thereby avoids the rejection under §102.

HUNG et al. also does not disclose the third and fourth interconnect levels of claims 45-46, 48-49, where the first copper layer is at the third level and the second copper layer is

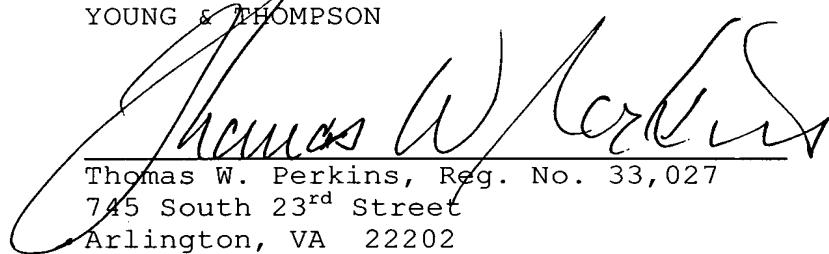
at the fourth levels. Accordingly, these claims further avoid the rejection under §102.

In view of the present amendment and the foregoing remarks, it is believed that the present application has been placed in condition for allowance. Reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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